

Integration of hosting capacity into Part 6 of the Code, sunset clause

Consultation paper

Submissions close: 5pm on Tuesday 1 September 2020

11 August 2020



Executive summary

This is a short paper to consult with interested parties on a further amendment to Part 6 of the Code and follows the consultation paper published in October 2019 on the topic of hosting capacity in low voltage networks.

Having considered submissions on the October 2019 consultation paper, the Authority considers that while the proposed Code amendment will deliver long-term benefits to consumers, it can be further improved.

Specifically, this paper proposes the addition of a 5-year time period for the addition of

- two advanced power quality modes that are included in the inverter standard AS/NZS 4777.2:2015 as optional modes only. The two modes are the volt-watt response mode and the volt-var response mode.
- a maximum export power limit for electrical installations to which new or upgraded distributed generation is to be connected – applications must comply with the limit specified by the distributor.

The purpose of including an end date is to incentivise local distributors and other industry parties (eg those that design and install small-scale distributed generation systems for investors) to develop innovative new approaches to managing network congestion and enhancing hosting capacity. Such approaches should, with appropriate future Code amendments, further improve upon current provisions in Part 6 that support efficient and reliable supply for the long term benefit of consumers.

We are consulting only on the addition of an end date. Therefore, we have allowed a 2 week period to receive submissions on this consultation paper.

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1 What you need to know to make a submission

What this consultation paper is about

- 1.1 The purpose of this paper is to consult with interested parties on the Authority's proposal to amend Part 6 of the Electricity Industry Participation Code (the Code) to change the eligibility criteria for distributed generation connection applications that seek to use the Part 1A connection application process.
- 1.2 This paper consults on an additional amendment the Authority proposes to make before finalising the integration of hosting capacity into Part 6 of the Code. As a whole, the proposed amendments will better align the application of Part 6 with the Authority's statutory objective by enhancing the hosting capacity of distributors' networks while maintaining reliable supply to all consumers.
- 1.3 The proposed additional amendment would add an end date to some of the proposed amendments to Part 6 previously consulted on. We are not seeking submissions on these proposed amendments, only on the addition of an end date for these amendments.
- 1.4 Section 39(1)(c) of the Act requires the Authority to consult on any proposed amendment to the Code and corresponding regulatory statement. Section 39(2) provides that the regulatory statement must include a statement of the objectives of the proposed amendment, an evaluation of the costs and benefits of the proposed amendment, and an evaluation of alternative means of achieving the objectives of the proposed amendment. The regulatory statement is set out in section 3 of this paper.

How to make a submission

- 1.5 The Authority's preference is to receive submissions in electronic format (Microsoft Word) in the format shown in Appendix B. Submissions in electronic form should be emailed to Part6hosting.Submissions@ea.govt.nz with "Consultation Paper—hosting capacity sunset clause" in the subject line.
- 1.6 If you cannot send your submission electronically, post one hard copy to either of the addresses below, or fax it to 04 460 8879.

Postal address

Submissions
Electricity Authority
PO Box 10041
Wellington 6143

Physical address

Submissions
Electricity Authority
Level 7, Harbour Tower
2 Hunter Street
Wellington

- 1.7 Please note the Authority wants to publish all submissions it receives. If you consider that we should not publish any part of your submission, please
 - (a) Indicate which part should not be published
 - (b) Explain why you consider we should not publish that part
 - (c) Provide a version of your submission that we can publish (if we agree not to publish your full submission).

- 1.8 If you indicate there is part of your submission that should not be published, we will discuss with you before deciding whether to not publish that part of your submission.
- 1.9 However, please note that all submissions we receive, including any parts that we do not publish, can be requested under the Official Information Act 1982. This means we would be required to release material that we did not publish unless good reason existed under the Official Information Act to withhold it. We would normally consult with you before releasing any material that you said should not be published.

When to make a submission

- 1.10 Please deliver your submissions by **5pm on Tuesday 1 September 2020**.
- 1.11 The Authority will acknowledge receipt of all submissions electronically. Please contact the Submissions' Administrator if you do not receive electronic acknowledgement of your submission within two business days.

2 The Authority proposes an additional provision

Background relevant to the Part 6 review is available in papers on the Authority's website

- 2.1 Distributed generation is generation connected directly or indirectly to a distributor's local network.¹ Part 6 of the Code regulates how distributed generation connects to a local network.²
- 2.2 Distributed generation includes small-scale generation systems such as rooftop solar photovoltaic (solar PV) installations, in-home battery installations, small wind turbines, and micro-hydro schemes. Small-scale systems have capacities up to 10 kilowatts (kW). These small-scale systems typically provide renewable energy sources for households and small businesses. Larger distributed generation installations may have capacities from 10 kW up to several tens of megawatts (MW).
- 2.3 In October 2019, the Authority published a consultation paper that proposed to amend Part 6.³ The purpose of the proposed Code amendment is to remedy three issues identified with Part 6, related to:
- (a) the current Code referencing an outdated standard
 - (b) the eligibility criteria for the Part 1A distributed generation connection application process in clause 1D of Schedule 6.1.
- 2.4 The proposed amendment would first replace the reference to a superseded technical standard in clause 1D(a) with the current standard, which is AS/NZS 4777.2:2015 and is relevant to power inverters.
- 2.5 Secondly, the proposed amendment would add new eligibility criteria to the existing criteria for the Part 1A connection application process. The new criteria would:

¹ The relevant definitions are contained in Part 1 of the Code, available at <https://www.ea.govt.nz/code-and-compliance/the-code/>

² Part 6 is available at <https://www.ea.govt.nz/code-and-compliance/the-code/>

³ The consultation paper is available at: <https://www.ea.govt.nz/dmsdocument/25855-consultation-paper-integration-of-hosting-capacity-into-part-6-october-2019>. The 19 submissions received are available at: <https://www.ea.govt.nz/development/work-programme/operational-efficiencies/market-enhancement-omnibus/consultations/>

- (a) make mandatory two advanced power quality modes that are included in the inverter standard AS/NZS 4777.2:2015 as optional modes only. The two modes are the volt-watt response mode and the volt-var response mode.
 - (b) introduce a maximum export power limit for electrical installations to which new or upgraded distributed generation is to be connected – applications must comply with the limit specified by the distributor
 - (c) better address connection applications in parts of the network subject to export congestion.
- 2.6 Distributed generation connection applications that did not meet the expanded eligibility criteria for the Part 1A process would remain able to use the Part 1 process.
- 2.7 The proposed amendment would incentivise those investing in small-scale distributed generation to install systems that use inverters that comply with the latest standard, including the optional modes described, because the Part 1A process provides connection applicants with a simpler process that has shorter timeframes.

The updated amendment introduces an end date for the new eligibility criteria

- 2.8 The Authority has considered the 19 submissions it received on the October 2019 consultation paper and has noted the general support for the proposed Code amendment.
- 2.9 Our preliminary view is that while the proposed Code amendment will deliver long-term benefits to consumers, it can be further improved. The proposed improvement put forward in this consultation paper is to include an end date that would automatically revert the eligibility criteria part of the amendment proposed in the October 2019 consultation paper back to its original state.
- 2.10 The first part of the proposed amendment is to replace the reference to the outdated standard, as described in paragraph 2.4 above. This part is not affected by the proposed addition of an end date.
- 2.11 The second part of the proposed amendment is to change the eligibility criteria for the connection application and approval process set out in Part 1A of Schedule 6.1, as described in paragraph 2.5 above. If adopted, this part would be affected by the proposed addition of an end date.
- 2.12 The purpose of including an end date is to:
- (a) review requirements taking into account changes in standards and technology that have occurred since the first consultation. For instance, the Authority has noted that AS/NZS4777.2:2015 is again under review, and that the outcome may include:
 - (i) volt-var and volt-watt modes being made mandatory with default settings that align with the EEA guidelines
 - (ii) enhanced anti-islanding protection settings
 - (iii) installations that incorporate battery storage to have requirements aimed at supporting system security
 - (b) incentivise local distributors and other industry parties (eg those that design and install small-scale distributed generation systems for investors installers) to develop innovative new approaches to managing network congestion and

enhancing hosting capacity. Such approaches should, with appropriate future Code amendments, further improve upon current provisions in Part 6 that support efficient and reliable supply in the long term interests of consumers. The intention is that the eligibility criteria is not a permanent solution and that it does not, to the extent we can reasonably foresee, conflict with the likely direction being taken by current and future standards development processes .

- 2.13 Renewable energy technology is evolving rapidly, along with the international standards that seek to standardise the equipment and installation procedures. In times of rapid technological development, fixed regulations can have the undesirable effect of locking in provisions that regulators consider to be appropriate at a point in time but which, over time, become inefficient roadblocks to ongoing innovation. In this case, the Authority seeks to balance the less desirable features of static regulation with a time limit.
- 2.14 While it is likely, that the inverter standard could be re-issued with further updates within the 5-year time period, the proposed end date of 5 years from the date the amendment comes into force will force a review, if the power quality issues related to distributed generation have not been resolved.
- 2.15 The end date incentivises distributors to adopt further change, including new technology, and develop competitive solutions, as well as ensure the Code does not lock in an engineering solution that may become outdated given the speed of technology change.
- 2.16 An alternative to the end date is an obligation for the Authority to undertake an operational review of Part 6 within 5 years. This option could have a wider scope than the proposed end date option, but has limitations if the review doesn't occur (for example, because the Authority's priorities change) and the Code locks in an outdated engineering solution. This alternative provides no incentive on distributors to seek technology or competition solutions to potential power quality issues on its network, and may leave the Code in a state where technology has superseded it.

Q1. Do you agree with the proposal to add an end date to the Code amendment previously consulted upon by the Authority, as described in this section? If not, why not?

3 Regulatory Statement for the proposed amendment

3.1 The regulatory statement provided in the Consultation paper - Integration of hosting capacity into Part-6 ⁴ would not have changed significantly had this additional proposed amendment been included within that consultation.

3.2 Please refer to that consultation paper for the regulatory statement.

The Authority has identified one other means for addressing the objective of this additional proposed Code amendment

3.3 With respect to the proposed inclusion of an end date, an alternative option considered is an obligation for the Authority to undertake an operational review of Part 6 within, say, 5 years. However, given the quite rapid development of new technology and standards, it is likely that the requirements will need to be reviewed within that time in any case.

3.4 The limitation of this option is if the review doesn't occur (for example, because the Authority's priorities change) the Code could lock in an outdated engineering solution.

The proposed amendment is preferred to other options

3.5 Between the option of including an end date and the option of requiring a review of Part 6 within a defined period of time, we consider the effects of either option could be quite similar.

3.6 The possibility of the review not happening given the speed of technology change means the Authority does not prefer this option. The important thing is to keep a close eye on otherwise static regulatory provisions in times of rapid technological development.

Q2. Do you agree the additional proposed amendment is preferable to the other option? If you disagree, please explain your preferred option in terms consistent with the Authority's statutory objective in section 15 of the Electricity Industry Act 2010.

Q3. Are there any other options that you consider a preferable to the options discussed? If so, please provide details.

The additional proposed amendment complies with section 32(1) of the Act

3.7 The Authority's objective under section 15 of the Act is to promote competition in, reliable supply by, and efficient operation of, the electricity industry for the long-term benefit of consumers.

3.8 Section 32(1) of the Act says that the Code may contain any provisions that are consistent with the Authority's objective and is necessary or desirable to promote one or all of the following:

Table 1: How proposal complies with section 32(1) of the Act

(a) competition in the electricity industry;	The proposed amendment would promote competition by providing an incentive for distributors to
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⁴ <https://www.ea.govt.nz/dmsdocument/25858-consultation-paper-integration-of-hosting-capacity-into-part-6>

	investigate alternative methods of maintaining power quality.
(b) the reliable supply of electricity to consumers;	The proposed amendment would promote reliable supply to consumers by ensuring that distributors investigated alternative methods of maintaining power quality that may deliver greater long term benefit.
(c) the efficient operation of the electricity industry;	The proposed amendment would promote the efficient operation of the electricity industry by incentivising further technological innovation in the rapidly evolving renewable energy space.
(d) the performance by the Authority of its functions;	The proposed amendment would not materially affect the performance of the Authority.
(e) any other matter specifically referred to in this Act as a matter for inclusion in the Code.	The proposed amendment would not materially affect any other matter specifically referred to in the Act for inclusion in the Code.

Q4. Do you agree the Authority's proposed amendment complies with section 32(1) of the Act? If you don't agree, please explain your reasons.

The Authority has given regard to the Code amendment principles

3.9 When considering amendments to the Code, the Authority is required by its Consultation Charter⁵ to have regard to the following Code amendment principles, to the extent that the Authority considers that they are applicable. Table 2 (below) describes the Authority's regard for the Code amendment principles in the preparation of the proposal.

Table 2: Regard for Code amendment principles

Principle	Comment
1. Lawful	The proposal is lawful, and is consistent with the statutory objective (see section 3) and with the empowering provisions of the Act.
2. Provides clearly identified efficiency gains or addresses	The efficiency gains are set out in the evaluation of the costs and benefits (section 3). The efficiency gains accrue from cost-effectively enhancing network hosting

⁵ The consultation charter is one of the Authority's foundation document and is available at: <http://www.ea.govt.nz/about-us/documents-publications/foundation-documents/>

Principle	Comment
market or regulatory failure	capacity, improving regulatory certainty and incentivising ongoing technological innovation.
3. Net benefits are quantified	The extent to which the Authority has been able to estimate the efficiency gains is set out in the evaluation of the costs and benefits (section 3).
4. Preference for small-scale 'trial and error' options	Not applicable
5. Preference for greater competition	Not applicable
6. Preference for market solutions	Not applicable
7. Preference for flexibility to allow innovation	Not applicable
8. Preference for non-prescriptive options	Not applicable
9. Risk reporting	Not applicable

Appendix A Proposed amendment

Key

- a) Black text that is not underlined is the existing Code
- b) Black text that is underlined is the proposed Code amendment for the consultation in October 2019 to establish eligibility criteria for the Part 1A application process.
- c) Red text is the changes that were made as a result of submissions received for the October 2019 consultation
- d) Green text is the proposed changes included within this consultation to sunset the eligibility criteria established in the October 2019 consultation.

Note: This consultation is only for the green text. We will not consider submissions on the red or black text.

1.1 Interpretation

...

connection and operation standards, in relation to a **distributor** or **distributed generation**,—

- (a) means requirements, as amended from time to time by the **distributor**, that—
 - (i) are set out in written policies and standards of the **distributor**; and
 - (ii) relate to connecting **distributed generation** to a **distribution network** or to a **consumer installation** that is connected to a **distribution network**, and the operation of the **distribution network**, including requirements relating to the planning, design, construction, testing, inspection, and operation of **distributed generation** that is, or is proposed to be, connected; and
 - (iii) are made publicly available in accordance with clause 6.3; and
 - (iv) reflect, or are consistent with, **reasonable and prudent operating practice**; and
- (b) includes the following, as amended from time to time by the **distributor**:
 - (i) the **distributor's congestion management policy**, as referred to in clause 6.3(2)(d); and
 - (ii) the **distributor's** emergency response policies; and
 - (iii) the **distributor's** safety standards; and
- (c) until [5 years from the Code effective date] 2025, may include the **distributor's** policies for specifying available **maximum export power** amongst categories of **network** users, a **maximum export power** threshold for applications under Part 1A of Schedule 6.1, and the methodology used to determine that threshold.

...

maximum export power means the maximum **active power** exported into the **local network** or **embedded network** at an **ICP** of a **distributed generator**, and is equal to—

- (a) the **nameplate capacity** of the **distributed generation** minus the minimum load at the **point of connection**; or
- (b) the power export limit imposed by an active export control device.

*Note to readers: we intend for the definition of **maximum export power** to be sunset and expire five years after the commencement date and if we decide to make this amendment we would include an explanatory note in the Code*

...

Part 6 Connection of distributed generation

...

6.3 Distributors must make information publicly available

- (1) The purpose of this clause is to require each **distributor** to make certain information publicly available to enable the approval of **distributed generation** under Schedule 6.1.
- (2) Each **distributor** must make publicly available, free of charge, from its office and Internet site,—
 - (a) forms for applications under Schedule 6.1; and
 - (b) the **distributor's connection and operation standards**; and
 - (c) a copy of the **regulated terms**, together with an explanation of how the **regulated terms** will apply if—
 - (i) approval is granted under Schedule 6.1; and
 - (ii) the **distributor** and the **distributed generator** do not enter into a connection contract; and
 - (d) a statement of the circumstances in which **distributed generation** will be, or may be, curtailed or interrupted from time to time in order to ensure that the **distributor's other connection and operation standards** are met; and
 - (da) a list of all locations on its **distribution network** that the **distributor**—
 - (i) knows to be subject to **export congestion**; or
 - (ii) expects to become subject to **export congestion** within the next 12 months; and
 - (db) until XXXX 2025, the maximum export power threshold and the methodology used to determine that threshold, for locations at which the distributor has set a maximum export power threshold for applications under Part 1A of Schedule 6.1; and
 - (e) a list of any fees that the **distributor** charges under Schedule 6.1, which must not exceed the relevant maximum fees prescribed in Schedule 6.5; and
 - (f) a list of the makes and models of inverters that the **distributor** has approved for connection to its **distribution network**; and
 - (g) the **distributor's** contact information for any enquiries relating to the connection of **distributed generation** to its **distribution network**.

...

Schedule 6.1 Process for obtaining approval

...

1D When application may be made under Part 1A

- (1) A **distributed generator** may elect to apply to a **distributor** under Part 1A instead of Part 1 if the **distributed generation** to which the application relates—
 - (a) is designed and installed in accordance with AS/NZS 4777.1:2016; and
 - (b) incorporates an inverter that—
 - (i) has been tested and issued a Declaration of Conformity with AS/NZS 4777.2:2015 by a laboratory with accreditation issued or recognised by International Accreditation New Zealand; and
 - (ii) has protection settings, control settings, and volt response mode settings that meet the **distributor's connection and operation standards**; and
- (2) Until XXXX 2025, in order to make an application under subclause (1), the distributed generation must also have:
 - (a) a volt-watt response mode;
 - (b) a volt-var response mode; ~~and~~
 - (c) control settings and volt response mode settings that meet the distributor's connection and operation standards; and

(de) a maximum export power limit at the ICP of the distributed generator that does not exceed the maximum export power threshold, if any, specified by the distributor in its connection and operation standards.

...

Part 1A

Applications for distributed generation of 10 kW or less in total in specified circumstances

...

9B Application for distributed generation of 10 kW or less in total in specified circumstances

...

(2) An application must include the following:

- (a) the name, contact, and address details of the **distributed generator** and, if applicable, the **distributed generator's agent**;
- (b) a brief description of the physical location at the address at which the **distributed generation** is or will be connected;
- (c) any application fee specified by the **distributor** in accordance with clause 6.3(2)(e);
- (d) details of the make and model of the inverter;
- (e) confirmation as to whether the inverter—
 - (i) is included on the **distributor's** list of approved inverters made publicly available under clause 6.3(2)(f); or
 - (ii) conforms with the protection settings , control settings, and volt response mode settings specified in the **distributor's connection and operation standards**;

~~(ea) confirmation that the **distributed generation** has a **maximum export power** that the **maximum export power** threshold, if any, specified by the **distributor** in its **connection and operation standards**;~~

- (f) if the inverter is not included on the **distributor's** list of approved inverters, a copy of the AS/NZS 4777.2:2015 Declaration of Conformity certificate for the inverter;
- (g) details of—
 - (i) the **nameplate capacity** of the **distributed generation**; and
 - (ii) the fuel type of the **distributed generation** (for example, solar, wind, or liquid fuel); ~~and~~
 - ~~(iii) the **maximum export power** of the **distributed generation**.~~

(2A) Until XXXX 2025, in order to make an application under subclause (2), an application must also include the following:

- (a) confirmation as to whether the inverter conforms with the control settings and volt response mode settings specified in the distributor's connection and operation standards;
- (b) ~~(a)~~ confirmation that the **distributed generation** has a **maximum export power limit** that meets does not exceed the **maximum export power** threshold, if any, specified by the **distributor** in its **connection and operation standards**; and
- (c) ~~(b)~~ the **maximum export power** of the **distributed generation**.

Q5. Do you agree with the drafting of the proposed amendment? If not, why not?

A.2

Appendix B Format for submissions

Submitter	
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Question	Comment
<p>Q1. Do you agree with the proposal to add an end date to the Code amendment previously consulted upon by the Authority, as described in this section? If not, why not?</p>	
<p>Q2. Do you agree the additional proposed amendment is preferable to the other option? If you disagree, please explain your preferred option in terms consistent with the Authority's statutory objective in section 15 of the Electricity Industry Act 2010.</p>	
<p>Q3. Are there any other options that you consider a preferable to the options discussed? If so, please provide details.</p>	
<p>Q4. Do you agree the Authority's proposed amendment complies with section 32(1) of the Act? If you don't agree, please explain your reasons.</p>	
<p>Q5. Do you agree with the drafting of the proposed amendment? If not, why not?</p>	

Glossary of abbreviations and terms

Authority	Electricity Authority
Act	Electricity Industry Act 2010
Code	Electricity Industry Participation Code 2010
EEA	Electricity Engineers' Association
solar PV	Solar photovoltaic
kW, MW	kilowatt, megawatt